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Forecasting Exposure in Order to Use High Throughput Hazard Data in a Risk-based Context

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The ToxCast program and Tox21 consortium have evaluated over 8000 chemicals using *in vitro* high-throughput screening (HTS) to identify potential hazards. Complementary exposure science needed to assess risk, and the U.S. Environmental Protection Agency (EPA)'s ExpoCast initiative has been developing mechanistic and heuristic models for high-throughput exposure (THE). Coupled with hazard-related HTS, HTE modeling can move risk-based evaluation earlier in chemical management decisions. Chemicals where the putative human dose of concern from hazard HTS is comparable to doses predicted by HTE become targets for further investigation. We used Bayesian analysis to infer ranges of exposures consistent with biomarkers measured in urine samples by the U.S. Centers for Disease Control National Health and Nutrition Examination Survey. We used linear regression models on chemical descriptors gleaned from databases and chemical structure-based calculators. Separate calibrations allow for demographic-specific prioritization of exposure. For all groups the same five heuristics are able to explain half of the variance in the inferred exposures; including children aged 6-11 and women of child bearing age. Those chemicals with properties and uses that are most like the chemicals to which people are known to be highly exposed are targets for further. *This abstract does not necessarily reflect Agency policy.*